

EASY CALIB airTOXIC: A73022 & A76022 AUTOCAL MAINTENANCE (updated 10/20)



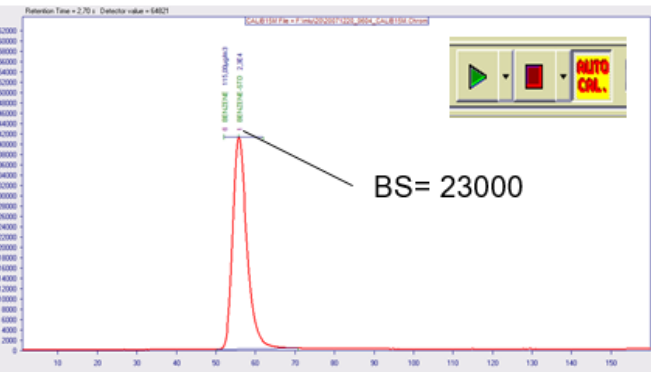
LAMP DRIFT

airTOXIC analyser use UV lamps for detection. The intensity of the lamp decreases with time. This phenomenon implies a decrease of the **Base Sensitivity** (BS) of the analyser so it is necessary to correct the drift with an automatic calibration system called **"AUTOCAL"**.

CALIBRATION, TOOLS and GENERALITIES

airTOXIC analysers are equipped with an internal calibration system.
Permeation tubes installed inside a **temperature and flow-controlled** oven generate a sample with a known concentration which permits to recalibrate continuously the analyser (**see values into your quality control document**).
During a calibration method, VISTACHROM calculates the **Base Sensitivity** (BS) of the analyser (area units/ ng of Benzene) thanks to the standard gas known concentration (see Fig3). This **new Base Sensitivity** is different of the **Initial Base Sensitivity** written into setup the GC (see Fig 4).

Example of chromatogram of calibration in Peak Viewer software (Fig1):

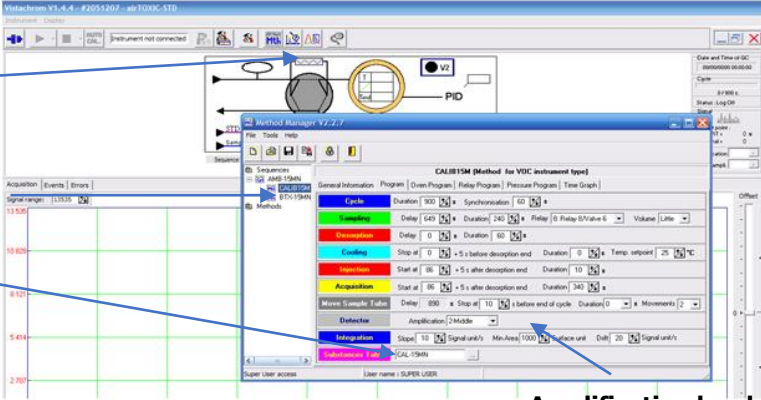


In this example, the BS calculated is 23000ua/ng of Benzen.
If you are in **AUTOCAL**, this BS replaces the last calculated and is taken into account for the calculation of the next concentrations **if it is within the alarm window of calibration substance table (Fig3)**. If not, the last BS remains active.

The First BS or initial BS of your analyser is written manually in the Setup the GC menu (Fig4).

Access to calibration substance table (Fig2):

- 1) Click on "Mth"
- 2) Select your analysis sequence
- 3) Select the calibration method
- 4) Select Program and open the substance table (Fig4).



Substance table of the calibration method (Fig3):

#	Name	RT Min	RT Max	Select Peak	GC Result formula	With X=
1	BENZENE-STD	49	59	Middle	X / (0.0631 * [SampleVol])	Area
2	BENZENE	49	59	Sum	1.1 * X * 0.9	Area/BS

Curve response of detector
Linear Auto-Calibration

X / Conc.
With X = [Area + AreaOfs]

Name	Value
Conc.	0.0631
AreaOfs	0
Average point N=	1
Min BS	3000
Max BS	50000

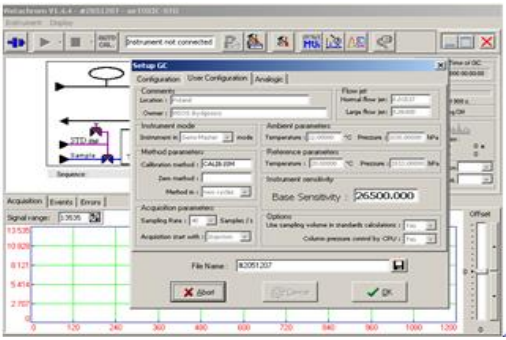
Number of measurement (average):
BS calculation average

Alarm window 3000 is the lowest BS accepted

Corrected concentration of the standard in mg/m³ (0.0631mg/m³)

How to access to the Base Sensitivity (Fig4):

Click on the "setup GC" , user configuration.
BS=26500 ua/ng of benzene
This is the **initial value of BS** for this analyser. This value **can be changed only manually**. Click on the "setup GC".
BS=26500 ua/ng of benzene
This is the **initial value of BS** for this analyser. This value **can be changed only manually**.



AUTOCAL MAINTENANCE

1) When the BS drifts below the alarm window (3000) (error 142: standard sensitivity is out of range), it is necessary to increase it.

We consider that **minimal BS is 3000**. If the drift drives the BS under this value:

1.1) Cleaning of the lamp


Each time the sensitivity is too low, you have to clean the UV lamp. It can occurs regularly.

- Stop your analyser **at the end of the cycle** and **Log off**
- Switch off the interrupter
- Wait few minutes the PID decrease in temperature
- Remove the lamp from the PID
- Clean the lamp with the cleaning kit (**ref. article : CS/CH/226/27-OPID**) cotton + abrasive powder + water and after acetone. (You can follow has it is described into the Cleaning UV lamp procedure)
- Replace the lamp
- Switch** your analyser **ON, Log ON, wait the PID to rise 150°C and start your analysis**



The lamp cleaning can be performed several times and when the **cleaning has no more effect, increase the amplification level of the AIRMOSENSE CARD.**

1.2) Switch of the amplification of the AIRMOSENSE CARD (if cleaning has no more effect):

- Stop your analyser at the end of the cycle
- Increase by 1 the amplification value of each method of your analytical sequence (cf. Fig2: CALIB15M and BTX-15MN), switch from 2-middle amplification to 3-high amplification.
- Save each modified method by clicking on 
- Launch several calibration methods (BS is multiplied by 10)

Note: if the BS still drifts under 3000 the lamp should be cleaning as described in chapter 1.a (cleaning of the lamp).

UV Lamp life time is about 2 years

2) Change of the permeation tube (analyser stopped and logged OFF):

- Open your permeation oven and extract the old permeation tube**
- Put the new one, do not touch the Teflon part with fingers, it may change the permeation rate.**
- Calculate the corrected concentration ($C_{1,cor}$) of your standard (in mg/m³) and enter the new value into the calibration substance table (see Fig3).

$$C_{1,cor} = \frac{1}{V} * \sqrt[1.1]{\frac{C_{1,real} * V}{0.9}}$$

$C_{1,cor}$: corrected concentration in mg/m³

$C_{1,real}$: real concentration in mg/m³ ; [Permeation rate (ng/min) / Dilution Flow (mL/min)]

V : Sampled volume

$b = 0.9$

$a = 1.1$

- Launch calibration methods then follow the Base Sensitivity